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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/726,987

12/03/2003

Manuel A. Quevedo-Lopez

TI-36376 (032350.B537)

5051

23494

7590

04/20/2005

TEXAS INSTRUMENTS INCORPORATED

P O BOX 655474, M/S 3999

DALLAS, TX 75265

EXAMINER

THOMAS, TONIAE M

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/726,987	QUEVEDO-LOPEZ ET AL.	
	Examiner	Art Unit	
	Toniae M. Thomas	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 4,6,8 and 26-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5,10-18,20 and 21 is/are rejected.
- 7) ☒ Claim(s) 2,3,7,9,19 and 22-25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of the invention of Group I, claims 1-3, 5, 7 and 9-25, in the reply filed on 31 January 2005 is acknowledged. Claims 26-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Claims 4, 6, and 8 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the specification does not provide antecedent basis for the dielectric layers recited in claims 7 and 10.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1, 10, 18, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Delpech et al. (US 6,391,802 B1).

The Delpech et al. patent (Delpech) discloses a method for manufacturing a semiconductor device (figs. 1A-1E and accompanying text). The method comprises: depositing a dielectric layer 2 on a substrate (fig. 1 B and col. 3, lines 52-54), and subjecting the dielectric layer to a plasma (fig. 1C and col. 3, line 66 - col. 4, line 2). In one preferred embodiment, the dielectric layer may be silicon oxynitride or tantalum pentoxide, both of which have a dielectric constant greater than the dielectric constant of silicon dioxide (col. 3, lines 21-23 and col. 6, lines 4-7). Note that silicon oxynitride is a ternary oxide.

In one preferred embodiment, the plasma is an oxygen plasma (col. 3, lines 9-10 and col. 5, line 66 - col. 6, line 3).

In another preferred embodiment, the plasma is a combination of any plasmas from the group of plasmas including argon, xenon, krypton, oxygen, nitrogen, and helium (col. 3, line 66 - col. 4, line 2).

4. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed

before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1, 5, 10, 11, 15-17, 20, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Bease et al. (WO 2004/021409 A2).

The Bease et al. published international application (Bease) discloses a method for manufacturing a semiconductor device. The method comprises: depositing a dielectric layer on a substrate (par. 30, lines 5-7), and subjecting the dielectric layer to a plasma (par. 30, lines 7-10). The dielectric layer has a dielectric constant greater than the dielectric constant of silicon dioxide (par. 4, lines 1-7; par. 30, lines 5-7; and claim 10).

In one embodiment, the dielectric layer comprises hafnium silicon oxide, which is a ternary oxide (claim 10).

The dielectric layer has a dielectric constant greater than 3.9 (par. 4, lines 1-7 and claim 10).

In one preferred embodiment, the plasma is an argon plasma (par. 19, lines 3-5 and claim 7).

In one preferred embodiment, the plasma is a xenon plasma (par. 19, lines 3-5 and claim 7).

In one preferred embodiment, the plasma is a krypton plasma (par. 19, lines 3-5 and claim 7).

In one preferred embodiment, the plasma is a helium plasma (par. 19, lines 3-5 and claim 7).

In one preferred embodiment, the plasma is a combination of any plasmas from the group of plasmas including argon, xenon, krypton, oxygen, nitrogen, and helium (par. 19, lines 3-5 and claim 7).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being obvious over Bease in view of Chambers (US 2004/0127003 A1).

The applied reference has a common assignee and at least one common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed

subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Bease does not teach depositing the dielectric layer using chemical vapor deposition (CVD), atomic layer deposition (ALD), or physical vapor deposition (PVD). Instead, Chambers teaches that dielectrics having high dielectric constants are typically deposited using one of CVD, ALD, or PVD (par. 6, lines 1-5).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify Bease by depositing the dielectric layer using one of CVD, ALD, and PVD, as taught by Chambers, because high dielectric constant materials are typically deposited using one of these methods.

***Allowable Subject Matter***

7. Claims 2, 3, 7, 9, 19, and 22-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday-Thursday from 8:30 a.m. to 5:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMT  
18 April 2005



**Mary Wilczewski**  
**Primary Examiner**